"STRANDED" OIL RESOURCES: THE NEW DOMESTIC OIL PRIZE

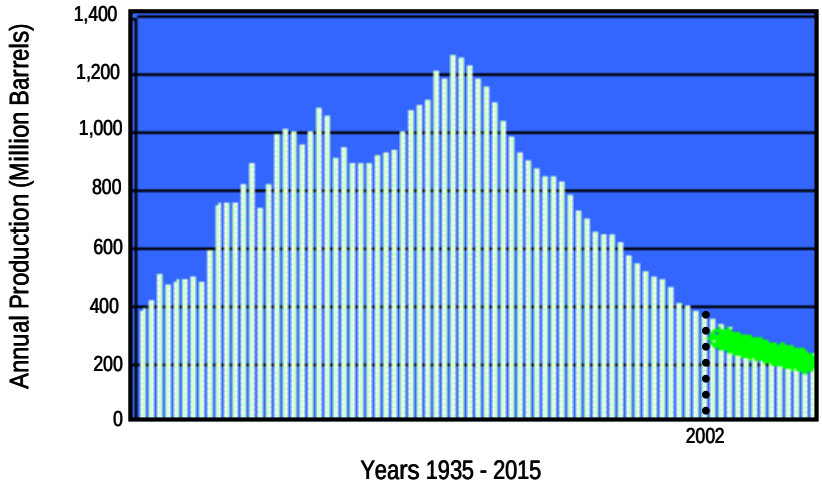
Testimony before the U.S. House of Representatives, Subcommittee on Energy and Resources on "Advances in Technology: Innovations in the Domestic Energy and Mineral Sector"

Vello A. Kuuskraa, President
Advanced Resources International

Good Afternoon. I am pleased to address the House Subcommittee on Energy and Resources on the topic of increasing domestic oil production.

Our nation's oil basins are mature and in decline. In the past 20 years, domestic oil production has dropped by 3 million barrels per day while demand for oil has continued to grow. The steep oil production decline in Texas is a mirror image of the situation in our other oil producing states, such as Alaska, California, Louisiana, Oklahoma, and Wyoming, Figure 1.

Figure 1. Texas Oil Production Is In Steep Decline, Similar to Other Mature Domestic Oil Basins

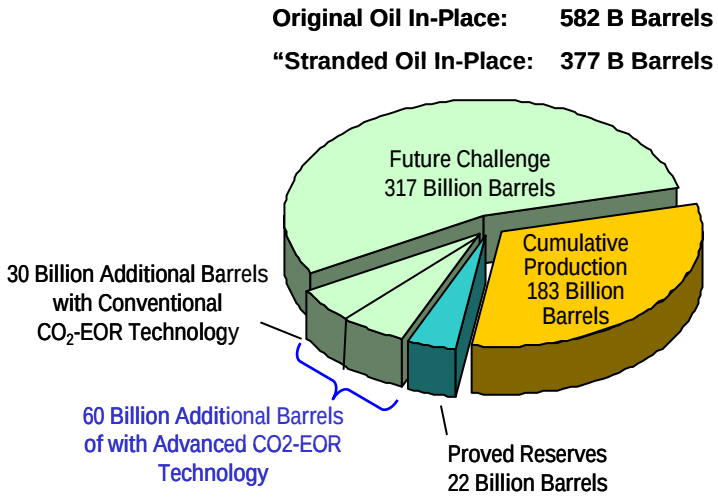


As a result, imports now provide over 60% of the oil we use, with serious implications for energy security.

However, the problem of declining domestic oil production is not due to a lack of resources. We still have nearly 400 billion barrels of oil that is being left behind,

"stranded". This is because our primary and secondary recovery methods recover only about one-third of the original oil in-place from our domestic oil fields, Figure 2.

Figure 2. "Stranded" Domestic Oil Resources



Numerous approaches are being tried to recover a portion of this "stranded" oil. The one with the highest, but still unrealized, potential is using CO_2-enhanced oil recovery (CO_2-EOR).

Twenty years ago, enthusiasm for this idea was high. Then we had the sharp drop in oil prices. This, along with lack of affordable CO_2 supplies and limits in the performance of technology, caused the enthusiasm to wane. Even so, CO_2-EOR still provides 200,000 barrels of oil per day, with important projects in Louisiana, Texas, and Wyoming.

During these turbulent years, I had the privilege of serving as the Society of Petroleum Engineers' Distinguished Lecturer on the topic of enhanced oil recovery. As I toured the oil centers, I saw first hand the enthusiasm and the subsequent disappointments.

Yet, the potential still exists. Now, nearly twenty years later, it is time readdress this potential. The question is - - *what will it take?*

In my view, we need to develop a unique set of "basin-opening" strategies for each of our mature domestic oil basins. Such strategies would reflect the reservoir conditions of

each basin, the opportunities for accessing CO_2 supplies, and the needs of pre-commercial R&D and field activities. While unique to each basin, this "basin-opening" initiative would have three common elements.

1. **First, it would contain policies and incentives to accelerate the use of CO_2-EOR.** A portfolio of performance-based incentives could be assembled, including: royalty relief, federal tax credits, reduced state severance taxes, and credits for capturing and productively using industrial emissions of CO_2. An incentive package equal to $5 per barrel for incremental oil produced by CO_2-EOR would be revenue neutral, from an overall public expenditures view. Each barrel of domestic oil provides this much or more to our various public treasuries.
2. **Second, it would promote significant advances in technology, particularly technology that increases oil recovery efficiency and lower costs.** Of priority would be testing new concepts such as gravity-stable CO_2 flooding and horizontal wells in our many geologically challenging oil reservoirs. Transfer of this technology to independent producers, who are now the backbone of our fledgling domestic CO_2-EOR industry would also be important.
3. **Third, it would stimulate increased supplies of affordable, "EOR-Ready" CO_2.** Improved technologies and incentives for capturing CO_2 from "zero emission" oil refining, gas processing, hydrogen production and other industrial plants could provide a portion of these supplies.

This "basin-opening" initiative reflects a new model of public-private partnerships and incentives. It would help "kick-start" activity and would attract capital to this promising, but still costly oil recovery alternative. A similar model of public-private partnerships and incentives helped launch the joint CO_2-EOR and CO_2 storage project in the Weyburn oil field in Saskatchewan. EnCana expects to recover an additional 130 million barrels of "stranded" oil while injecting two million tons of CO_2 emissions from the Dakota Gasification Company in Beulah, North Dakota, making this Canada's largest CO_2 sequestration project. The benefits of this initiative are many.

1. **Conserving Domestic Resources**. Recent work by our company, Advanced Resources, indicates that, with advances in CO_2-EOR technology, 30 to 60 billion barrels of "stranded" domestic oil would become recoverable, more than doubling

our current domestic reserves. Work to date on the oil basins of California, onshore Louisiana and Mississippi, and East Texas has identified 14 billion barrels of recoverable resource from CO_2-EOR. Future work will address the other major domestic oil basins and will specifically examine the potential of advanced technology.

2. **Increasing Domestic Oil Production**. An aggressive, successful initiative could add one million barrels per day of domestic oil production by 2015 and twice this by 2025, helping maintain a viable domestic oil production and service industry and improving energy security. Several efforts are underway in the geologically most favorable reservoirs. For example, Anadarko Petroleum has started CO_2-EOR in three Wyoming oil fields that are projected to add 50,000 barrels of oil per day by 2010. Kinder-Morgan is conducting a CO_2-EOR project at SACROC in West Texas that is expected to have similar results.
3. **Strengthening Our Economy**. This initiative could create 200 thousand new, high-paying jobs while reducing our trade deficit by ten to twenty billion dollars per year. Using the State of Texas Controller's Input-Output model of the Texas economy, and applying this model to the other oil producing states, would provide a considerably higher estimate of 400 thousand new, sustainable jobs.
4. **Reducing Carbon Intensity**. Capturing and productively using industrial CO_2 emissions would help meet the President's goal of reducing the carbon intensity of our economy. Approximately 150 million tons of high-concentration CO_2 emissions are released annually from cement and ammonia plants, from hydrogen units at refineries, from gas processing plants and from other industrial facilities. Advances in technology would enable a significant portion of these emissions to be economically captured, providing valuable supplies of "EOR-Ready" CO_2.

Today, I am using the word "prize" to describe CO_2 enhanced oil recovery and "stranded" domestic oil. I urge you to support this initiative, one that helps improve domestic energy security while addressing environmental concerns, in whatever ways are available and you believe are appropriate.